3.15 TRAFFIC AND TRANSPORTATION

This section discusses potential traffic and transportation impacts associated with the proposed project and identifies mitigation measures designed to limit the extent and magnitude of the impacts. Transportation and traffic data and the impact analysis are based on a literature review and field surveys performed by the Applicant.

3.15.1 Existing Conditions

Site Location and Access

The proposed project would be sited on the eastern edge of the refinery between Grandview and Brown roads. The project area is approximately 6 miles northwest of Ferndale, Washington, 7 miles southeast of Blaine, Washington, and about 15 miles north of Bellingham, Washington. The nearest community is Birch Bay, Washington, approximately 2 miles northwest of the site. The U.S.-Canada border is approximately 8 miles directly north of the proposed project site.

Figure 3.15-1 shows the transportation network in the surrounding area. The cogeneration facility and construction laydown areas are located on the south side of Grandview Road, east and west of Blaine Road, respectively, and on the east side of the existing refinery.

Roadways

Figure 3.15-2 shows existing roadway characteristics in the project vicinity. SR 548 is a two-lane state highway classified by WSDOT as a collector and a class two access highway.

SR 548 was recently improved from I-5 to Blaine Road under a project that provided a pavement overlay and improved pavement markings and traffic signs. The roadway has 11-foot-wide lanes, 8-foot-wide paved shoulders, drainage ditches, and wire fences on both sides. The posted speed limit is 50 mph.

The SR 548/Blaine Road intersection is in the center of the project site. SR 548 makes a right-angle turn at this intersection, with the state highway designation on the east and north legs. North of the Blaine Road intersection, the posted speed limit is 45 mph.

Other than SR 548, the other public roads in the vicinity are county roads such as Grandview Road, which is west of Blaine Road along the north frontage of the refinery. County roads in the area are two-lane rural roads. Speed limits are generally 50 mph, except for more developed areas such as in the Birch Bay area and near Blaine, Ferndale, and the I-5 interchanges, where the speed limits are lower.

The Applicant's property has a network of private roads that serve the refinery and provide access to the project site. The south leg of the SR 548/Blaine Road intersection is a paved, private road with a locked gate. It is posted with a sign that reads, "BP Property, Contractor Entrance, Not a Through Road." The gate, marked with orange reflectors, is normally closed and locked.

Pedestrian and Bicycle Facilities

There are no improved pedestrian or bicycle facilities in the project vicinity.

Traffic Volumes

Table 3.15-1 summarizes average daily traffic (ADT) volumes at various locations on SR 548 (from 1996 through 2000). Trucks comprised approximately 12% of the 1999 ADT on SR 548 between I-5 and Portal Way, of which 6% were single unit, 3% double units, and 3% triple units.

Figure 3.15-3 shows available historical daily traffic counts on the roads in the project vicinity, taken from traffic counts conducted by WSDOT and Whatcom County (from 1995 through 2000). During 2000, the ADT on I-5 south of SR 548 was 33,000 and the ADT on I-5 north of SR 548 was 25,000.

Average weekday traffic volumes are generally higher in the summer and lower in the winter because of increased recreational, agricultural, and construction traffic in the summer. August has the highest traffic volumes, approximately 13% higher than the annual average, and January has the lowest traffic volumes, approximately 20% lower than the annual average.

Table 3.15-1: Average Daily Traffic Volumes on SR 548

Location	1996 ADT	1997 ADT	1998 ADT	1999 ADT	2000 ADT
West of I-5	7,300	7,500	7,500	7,600	9,100
West of Portal Way	Not Available	Not Available	Not Available	6,100	6,200
West of Vista Drive	2,800	2,900	3,500	3,600	3,700
West of Kickerville Road	2,700	2,800	2,800	3,200	3,200
South of Birch Bay-Lynden Road	2,000	2,000	2,100	2,100	2,800
South of Peace Portal Drive	7,400	5,700	5,800	6,000	6,000

Source: WSDOT and Whatcom County

Figure 3.15-4 shows 2001 average daily traffic volumes on roads in the project vicinity. Existing traffic volumes were predicted by applying a 6% annual growth rate in traffic volumes, which was determined by comparing the growth in ADT on SR 548 contained in WSDOT's annual traffic reports.

Figure 3.15-5 shows 2001 weekday PM peak-hour traffic volumes at intersections on SR 548. The Applicant identified these intersections as locations that would be used by project traffic traveling to and from the proposed project. Weekday PM peak-hour traffic volumes are typically used for analysis because they reflect traffic conditions when the potential for congestion is greatest. The PM peak-hour traffic volumes shown in Figure 3.15-5 were counted during the two-hour commuter peak period from 4 to 6 p.m. The PM peak hour typically begins between 4:30 and 5 p.m. The peak traffic direction on SR 548 is eastbound during the PM peak hour, largely from employees leaving the refinery.

Figure 3.15-1: Transportation Network in the Project Vicinity

Figure 3.15-2: Existing Roadway Characteristics

Figure 3.15-3: Available, Historical Daily Traffic Counts

Figure 3.15-4: 2001 Average Daily Traffic Volumes

Figure 3.15-5: 2001 Weekday PM Peak-Hour Traffic Volumes

Refinery Construction Activity

Construction activities are a regular occurrence at the refinery site. The number of construction workers varies between approximately 400 and 2,400 depending on the type and number of projects under way. According to the Applicant, the construction peak occurs during a two- to three-week period every two to three years, when a major maintenance overhaul is performed at the refinery.

Transit, Pedestrian, and Nonmotorized Traffic

There is no transit bus service in the project vicinity. Existing pedestrian and bicycle traffic volumes on roadways in the area are extremely low.

Levels-of-Service

Level-of-service (LOS) is a qualitative measure that is typically used to describe operational conditions within a traffic flow and the perception of these conditions by drivers or passengers. These conditions include factors such as speed, delay, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. LOS is given letter designations from A to F, with A representing the best operating conditions (free flow, little delay) and F representing the worst (congestion, long delays).

Table 3.15-2 shows existing PM peak-hour LOS and average delays at eight intersections on SR 548. Because of the relatively low existing traffic volumes, these intersections currently operate at LOS B or C, which indicates there is no significant traffic queuing or congestion.

Table 3.15-2: PM Peak-Hour Level-of-Service Summary

Intersection	Movement/Approach	LOS[1]
SR 548/I-5 northbound on-ramp (MP 0.00)	Northbound	C (17.6)
SR 548/I-5 southbound on-ramp (MP 0.09)	Southbound	B (11.7)
SR 548/Portal Way (MP 0.29)	Overall	C (16.3)
SR 548/Vista Drive (MP 0.97)	Overall	B (10.7)
SR 548/Kickerville Road (MP 4.93)	Northbound	B (14.0)
SR 548/Blaine Road (MP 5.93)	Southbound	B (12.0)
SR 548/Birch Bay-Lynden Road (MP 8.96)	Overall	B (13.8)
SR 548/Peace Portal Drive (MP 11.80)	Southbound	C (16.8)

1 Number shown is the average control delay in seconds per vehicle for the overall intersection at an all-way, stop-controlled intersection, or worst-case approach at a stop-sign-controlled intersection. These values determine the LOS for intersections according to the 2000 Highway Capacity Manual (Transportation Research Board 2000).

MP = milepost

The transportation element of the Whatcom County Comprehensive Plan designates LOS C as the LOS standard for rural state routes and LOS D as the LOS standard for urban state routes in Whatcom County (1997). The comprehensive plan designates various UGAs within the county. The proposed cogeneration facility is located within the Major/Port Industrial UGA. SR 548 is within the UGA from Kickerville Road to approximately one-half mile east of Blaine Road, and

Grandview Road is the northern boundary of the UGA from the west. All eight of the intersections listed in Table 3.15-2 are within one of Whatcom County's UGAs.

Roadway Safety

Table 3.15-3 summarizes the most recent five-year (1995-1999) traffic accident history on two segments of SR 548. There were no recorded fatal accidents. For comparison, the 1996 average accident rates on state highways were 1.74 in Whatcom County and 1.88 statewide. There are no high accident locations or high accident corridors on SR 548.

Table 3.15-3: Five-Year Accident History on Two Segments of SR 548

	1995	1996	1997	1998	1999	2000
I-5 to SR 548/Blaine Road (5.93 miles)						
Number	4	20	N/A	10	9	7
Accident Rate[1]	0.7	3.3	N/A	1.3	1.2	0.9
SR 548/Blaine Road to Dakota Creek Bridge (5.65 miles)						
Number	14	26	N/A	8	12	15
Accident Rate[1]	3.0	5.0	N/A	1.6	2.5	2.3

Source: BP 2002, Appendix I
1 Accidents per million vehicle miles

Table 3.15-4 summarizes a three-year (1998-2000) traffic accident history at selected major intersections on SR 548 between I-5 and Peace Portal Drive/Bell Road. The intersection accidents are included in the totals for the roadway segment. The number of intersection accidents and the resulting rates are low; SR 548 does not appear to be unusually hazardous.

Table 3.15-4: Three-Year Accident History at Selected Major Intersections on SR 548

Intersection	1998[1]	1999	2000	Total	Rate[2]
I-5 northbound on-ramp (MP 0.00)	0	0	0	0	0.00
I-5 southbound on-ramp (MP 0.09)	0	0	0	0	0.00
Portal Way (MP 0.29)	1	1	2	4	0.34
Vista Drive (MP 0.97)	1	0	1	2	0.23
Kickerville Road (MP 4.93)	1	2	0	3	0.45
SR 548/Blaine Road (MP 5.93)	1	0	1	2	0.28
Bay Road (MP 6.96)	0	0	0	0	0.00
Birch Bay-Lynden Road (MP 8.96)	0	3	1	4	0.37
Drayton Harbor Road (MP 10.85)	1	1	1	3	0.30
Peace Portal Drive/Bell Road (MP 11.80)	2	2	3	7	0.72

Source: BP 2002, Appendix I
MP = milepost
1 Partial Listing. According to WSDOT, approximately 36% of the accident records are not yet entered into the system.
2 Rate - Accidents per million vehicle miles.

Waterborne, Air, and Rail Traffic

Recreational boats, commercial ships, and barges operate in the Strait of Georgia and its bays in the project vicinity. Boat launch ramps and associated facilities are available to recreational boaters at Birch Bay.

The refinery owns and operates a pier at Cherry Point, about 1 mile southwest of the proposed project site. The refinery pier serves ocean-going tankers that deliver crude oil from Alaska to the refinery. Ships and barges also operate from the pier to move refined petroleum products from the refinery to market. Tanker trucks move petroleum products from a truck rack located at the refinery to local markets. The nearest airport is Blaine Municipal Airport, approximately 7 miles north of the proposed project site in Blaine. The other airport in the area is Bellingham Airport, approximately 12 miles to the southeast.

An active railroad track owned and operated by BNSF railway parallels I-5 along the west side of Portal Way and Peace Portal Drive (Figures 3.15-1 through 3.15-8). The single-track line connects the BNSF transcontinental mainline in Everett with Bellingham, Ferndale, Blaine, and Vancouver, Canada. The railroad speed limit is 50 mph. Between Ferndale and Blaine, the BNSF railroad track crosses 10 roadways. SR 548 is the principal route to and from I-5 for hauling materials. All of the railroad grade crossings on SR 548 are protected by active warning devices, including flashing red lights and gate arms, as well as passive warning devices such as signs and pavement markings. The railroad crossing and other locations are shown in Table 3.15-5 by milepost between I-5 and Peace Portal Drive.

Table 3.15-5: Railroad Crossings on SR 548

Crossing	Milepost
I-5 Overcrossing	MP 0.00
Portal Way	MP 0.29
BNSF Railroad Grade Crossing (No. 084841X)	MP 0.31
Vista Drive	MP 0.97
Kickerville Road	MP 4.93
BNSF Railroad Grade Crossing (No. 096133H)	MP 5.16
Blaine Road/SR 548	MP 5.93
Bay Road	MP 6.95
Birch Bay-Lynden Road	MP 8.96
Dakota Creek Bridge	MP 11.58
BNSF Railroad Grade Crossing (No. 084853S)	MP 11.78
Peace Portal Drive/Bell Road	MP 11.80

A BNSF spur track runs to the refinery from the junction just north of Custer on the Everett-Vancouver track approximately 5 miles south. The railroad speed limit on the spur track is 25 mph.

3.15.2 Impacts of the Proposed Action

Construction

Site Access and Parking

Primary access to the project area during construction would be from Grandview Road to Blaine Road, then Blaine Road to the west access road (Access Road 1). Secondary access to the facility would be from a proposed private access road (Access Road 2) that would run from the southwest corner of the site to the existing private road extension of Blaine Road. The Blaine Road extension, Brown Road, and other existing private roads within the Applicant's property would provide internal access.

A third access road (Access Road 3) would connect the facility to a private transmission corridor maintenance road located on the Applicant's property that extends south to Brown Road. This proposed access road would provide access to the transmission corridor south of the cogeneration facility and Tower 4. Another maintenance road within the transmission corridor connects Tower 3 and Tower 2 and intersects with Brown Road. If the option to reconstruct the towers and transmission lines of the Custer/Intalco Transmission Line No. 2 is selected, then access to the transmission corridor would be from various locations.

During construction, most of the site-generated traffic would use the existing private road extension of Blaine Road south from SR 548 into the Applicant's property. The contractors' parking lot, construction trailer parking, and Laydown Areas 1, 2, and 3 would be located on the west side of this existing Blaine Road extension. Laydown Area 4 would also be used during construction. The laydown areas would be used for the storage and assembly of construction materials and equipment.

Vehicle Trip Generation

Project-generated traffic volumes during construction would be produced by employees commuting to and from work at the job site, as well as owner, contractor, supplier, regulator, and service vehicles (including trucks of various sizes) doing business at the site. The Applicant has estimated the number of vehicle round trips each month during construction, assuming mobilization in February 2004 through December 2005 (Duke/Fluor Daniel 2001). These round-trip estimates are based on detailed monthly estimates of the number of workers onsite for each construction craft and trade, the number of management staff onsite, truck deliveries of equipment, heavy equipment deliveries, and deliveries of site preparation materials.

Construction would require approximately 24 months, during which time the size of the work force would vary. Construction work at the cogeneration facility is expected to occur primarily on weekdays during the daytime.

Table 3.15-6 shows the estimated vehicle trip generation during average and peak construction conditions. Estimates are also shown for an average weekday and for the AM and PM peak hours. Trip generation estimates are based on the Applicant's round-trip estimates, supplemented

by published trip generation data available for utilities and other comparable land uses (Institute of Transportation Engineers 1997).

A vehicle trip, as shown in Table 3.15-6 and as used in this analysis, is defined as a single or one-direction vehicle movement with either the origin or destination (exiting or entering) inside the project site. The trip generation values shown in Table 3.15-6 account for all site trips made by all vehicles for all purposes, including employee, owner, contractor, supplier, regulator, visitor, and service and delivery vehicle trips.

Table 3.15-6: Estimated Vehicle Trip Generation

Time Period	Trips Entering	Trips Exiting	Total Trips
Average Construction Conditions			
Average Weekday	325 (50%)	325 (50%)	650
AM Peak Hour	144 (90%)	16 (10%)	160
PM Peak Hour	25 (15%)	140 (85%)	165
Peak Construction Conditions			
Average Weekday	600 (50%)	600 (50%)	1,200
AM Peak Hour	266 (90%)	30 (10%)	296
PM Peak Hour	46 (15%)	258 (85%)	304
Project Operation Conditions			
Average Weekday	70 (50%)	70 (50%)	140
AM Peak Hour	23 (90%)	3 (10%)	26
PM Peak Hour	4 (15%)	23 (85%)	27

Based on information developed by the Applicant, the peak number of monthly round trips would be approximately 10,300 in December 2004. This would be approximately 600 round trips each workday, or 1,200 one-way trips. For this analysis, an estimate of 1,200 (one-way) site-generated trips is shown in Table 3.15-6 for an average weekday during peak construction conditions.

The roadway traffic PM peak hour is the highest traffic volume hour of the day and is used as the basis for determining traffic impacts. As shown in Table 3.15-6, the PM peak-hour vehicle trips generated by the proposed project during peak construction are estimated to be 46 entering the site and 258 exiting, for a total of 304 trips.

Truck Trips

Truck trips are included in the trip generation estimates shown in Table 3.15-6. Large, heavy equipment would be transported to the refinery site by rail. Cranes would probably transfer this large, heavy equipment from the railroad car to an oversize truck for delivery to the job site.

During construction, some onsite soil would be removed and disposed of at approved sites. Various quantities of fill, including sand and gravel, would also be imported to the site. In addition, construction materials would be brought to the site that would include concrete, sheet and metal piping. Table 3.8-1 in Section 3.8 lists estimated quantities of these materials to be

used during construction of the proposed project. Imported fill, sand, and aggregate quantities are estimated at 151,650 cubic yards. Assuming trucks with a 20-cubic-yard capacity, this would result in 7,583 one-way truck trips.

Acquisition of fill material, sand, and gravel would be the responsibility of the construction contractor. Specific routings to and from the sources of materials would need to be identified in the Construction Transportation Management Program and approved by WSDOT and Whatcom County.

While specific routings are not known at this time, truck traffic would most likely use the principal arterials or roadways from material sources to the cogeneration facility. Potential impacts could affect roadway and/or intersection operations thereby worsening levels of service or increasing queue lengths or delays. Other impacts could include an increase in accidents or at least the potential for more accidents that accompany increased congestion (see Figure 3.1-6).

Vehicle Trip Distribution

Figure 3.15-6 shows the estimated distribution and assignment of project-generated trips for peak construction conditions. The distribution of site-generated trips is based on the characteristics of the road network, existing traffic patterns, historical and projected development in the area, locations where workers would likely reside, and the location of other potential trip origins and destinations.

Construction materials would arrive at the project site in trucks via I-5 and SR 548, except for large, heavy equipment that would arrive by rail. Heavy equipment would be transported by rail and off-loaded at the BNSF rail spur at the refinery. Heavy equipment would be loaded onto heavy haul vehicles or trailers and delivered to the cogeneration facility area via interior refinery roads. The steam turbine would be delivered in sections and assembled onsite.

Heavy equipment would include the following: turbines, generators, transformers, and other pieces of large, heavy equipment required for the project The approximate sizes of these various pieces of equipment range up to almost 17 feet in height, over 19 feet in width, and 77 feet in length. Approximate weights range from 85,000 to 741,000 pounds.

The project's trip distribution for average construction conditions is expected to be the same as for the peak construction conditions. Since the estimated vehicle trip generation is proportional to employment, the average weekday and PM peak-hour volumes generated during average construction conditions would be approximately 54% of the volumes shown in Figure 3.15-6 for peak conditions.

Figure 3.15-6: Project-Generated Trips for Peak Construction Conditions

Traffic Volumes

Travel demand on the roadway network is typically composed of three elements:

- Existing traffic
- Estimated project-generated traffic
- Estimated future non-project traffic

Estimated future non-project traffic may include traffic volumes generated by other land development projects that are planned, but not yet operational, changes in traffic patterns from roadway improvements or operations, and the effects of population and business growth. No changes in traffic patterns from roadway improvements or operations are expected by 2004. A 5% annual growth rate for traffic volumes was used to estimate future traffic volumes. This rate was calculated based on PM peak-hour traffic volumes at the SR 548/Kickerville Road intersection. This 5% growth rate accounts for the effects of general population and business growth in the project vicinity.

Figure 3.15-7 shows projected 2004 PM peak-hour and average weekday traffic volumes during peak construction conditions at intersections on SR 548. These volumes include the existing traffic volumes, the estimated project-generated traffic volumes, and the 5% growth rate.

Levels-of-Service

LOS was determined at the intersections on SR 548 during the PM peak hour during peak construction conditions (Table 3.15-7). Average delays would increase because of the project, but the intersections would continue to operate at LOS B or C, which is within acceptable county standards. Exceptions are the I-5 northbound ramp intersections and the Portal Way intersection. The I-5 northbound ramp intersections would drop to LOS D during the PM peak hour during peak construction conditions, which is still considered to be acceptable by WSDOT.

Table 3.15-7: PM Peak Hour Level-of-Service Summary – Proposed Action

Intersection	Movement/Approach	2004 With Project[1]
SR 548/I-5 northbound on-ramp (MP 0.00)	Northbound	D (29.4)
SR 548/I-5 southbound on-ramp (MP 0.09)	Southbound	B (13.3)
SR 548/Portal Way (MP 0.29)	Overall	F (64.6)
SR 548/Vista Drive (MP 0.97)	Overall	C (18.1)
SR 548/Kickerville Road (MP 4.93)	Northbound	C (21.7)
SR 548/Blaine Road (MP 5.93)	Southbound	C (24.0)
SR 548/Birch Bay-Lynden Road (MP 8.96)	Overall	C (21.6)
SR 548/Peace Portal Drive (MP 11.80)	Southbound	C (20.8)

1 Number shown is the average control delay in seconds per vehicle for the overall intersection at an all-way, stop-controlled intersection, or worst-case approach at a stop-sign-controlled intersection. These values determine the LOS for intersections according to the 2000 Highway Capacity Manual (Transportation Research Board 2000).

MP = milepost

The SR 548/Portal Way intersection would operate at LOS F during the PM peak hour during peak construction conditions without any mitigation. The project is not expected to have a significant impact on I-5 because of its distance from the project site (more than 5 miles) and its large capacity. Approximately 45% of site-generated traffic (approximately 540 vehicles per day during the construction peak) is expected to use I-5 south of SR 548. Significantly less site-generated traffic would use I-5 north of SR 548. Therefore, even with the project, I-5 would continue to operate at a high level-of-service, with traffic volumes well below capacity.

Other Traffic Impacts

Other traffic impacts may include the following:

- Accident rates are not expected to increase with construction of the proposed project.
- Any modifications or improvements made to county roads and SR 548 would be done in accordance with the appropriate county and WSDOT safety standards.
- The amount of hazardous waste generated at the site during construction is expected to be small. However, any hazardous waste would be transported by licensed contractors to licensed disposal facilities, in accordance with existing county and state regulations.

Waterborne, Air, and Rail Traffic

Most construction materials for the facility would not require rail transport. However, large, heavy pieces of equipment (such as turbines, generators, and transformers) may be delivered by rail and transferred to oversize trucks, as discussed above. Such transport is anticipated to be incidental, and the transfer of components to oversized trucks for onsite delivery would occur at existing local railroad tracks. If rail transport is used, it is expected that BNSF would be able to coordinate transport and unloading activities without adversely affecting its system. The project is not expected to require waterborne or air transport during construction of the proposed facility.

Operation

Site Access and Parking

Primary access to the project site (Access Road 1) would be from a proposed access road that would intersect the south side of SR 548. Passenger vehicle parking would be provided in a parking lot adjacent to the administration building on the west side of the proposed access road. The primary access would be used by nearly all of the site-generated traffic during operation of the proposed project.

Figure 3.15-7: Projected 2004 PM Peak-Hour and Average Weekday Traffic Volumes with Project

Secondary access to the site (Access Road 2) would be available from the existing extension of Blaine Road into the refinery. Access Road 3 would link the existing maintenance road that runs south to Brown Road. The existing private roads within the Applicant's property would provide for the relatively small amount of internal traffic expected between the refinery and the proposed cogeneration facility. These internal roads would allow access to the project from the existing refinery gates. However, the Blaine Road extension and other existing gates would not normally be used by traffic generated by the proposed project.

Access Road 3 to the maintenance road from the project site south would be used for maintenance and security access to the transmission line corridor just south of the project.

Vehicle Trip Generation

Traffic volumes during operation of the project would result from employees commuting to and from work at the site, as well as owners, suppliers, regulators, and maintenance and service workers (including trucks of various sizes) conducting business at the site. When the project is operational, about 30 employees would be needed to staff the facility daily. A maximum of 25 employees are expected to be present on the site at any point in time (including shift change and training). The cogeneration facility is expected to operate 24 hours per day, seven days per week. It is anticipated that some employees would work standard office hours, while others would work in shifts.

Table 3.15-6 shows the project construction and operation vehicle trip generation. Estimates are shown for an average weekday and for AM and PM peak hours. Trip generation estimates are based on the number of employees and published average vehicle trip generation rates available for utilities and other comparable land uses. The trip generation rate is 4 trips per employee on an average weekday, 0.74 trips per employee during the AM peak hour, and 0.76 trips per employee during the PM peak hour.

Chemicals to be used during operation would be shipped to the project site in tanker trucks, including anhydrous ammonia, caustic, sulfuric acid, and BFW chemicals (oxygen scavenger, neutralizing amine). Each truck typically holds approximately 8,000 gallons. The number of estimated truck trips is as follows:

- Approximately 23 round-trip tanker truck trips (46 one-way trips) per year would be required for anhydrous ammonia deliveries.
- Approximately 28 round-trip tanker truck trips (56 one-way trips) per year would be required for caustic deliveries.
- Approximately 13 round-trip tanker truck trips (26 one-way trips) per year would be required for sulfuric acid deliveries.
- Approximately three round-trip tanker truck trips (six one-way trips) per year would be required for each BFW chemical.

As shown in Table 3.15-6, the PM peak-hour vehicle trips generated by operation of the project are estimated to be four entering the site and 23 exiting, for a total of 27 trips. Truck trips are included in the trip generation estimates shown in the Table 3.15-6.

Vehicle Trip Distribution

The distribution of vehicle trips during project operation is estimated to be the same as for the peak construction conditions shown in Figure 3.15-6. The resulting trip assignment on an average weekday during project operation would be 104 trips on SR 548 east of the project site (including 20 PM peak-hour trips), six trips on Grandview Road west of Blaine Road (including one PM peak-hour trip), and 31 trips on SR 548 north of the Blaine Road intersection (including six PM peak-hour trips). Chemicals and most other materials and equipment would arrive at the site in trucks from I-5 and SR 548.

Traffic Volumes

Project-generated traffic volumes during operation would be minimal. The increase in traffic volumes from operation of the proposed project would be low. Total volumes on SR 548 would remain low relative to the capacity of the roadway.

Because of the low traffic volumes during project operation, the study area intersections on SR 548 would continue to operate at LOS B or C. The only exception is the SR 548/Portal Way intersection; it is calculated to operate at LOS D, which is considered acceptable by WSDOT. Delays would be few, and no substantial traffic queuing or congestion is expected.

The volume of maintenance and security traffic generated by the transmission line towers would be very low. The amount of hazardous waste generated at the site during project operation is expected to be small.

An analysis of the potential occurrence of icing and fogging as a result of the cooling tower was performed by the Applicant to determine if there would be any impact to local traffic. The analysis determined that there is no potential for icing, and that fogging may occur 2.5 hours per year, approximately 650 to 1,650 feet to the northwest and northeast, which is on the north side of Grandview Road, and would not impact vehicle traffic.

Waterborne, Air, and Rail Traffic

Operation of the cogeneration facility would not require waterborne, air, or rail transport except for the unanticipated need to replace a large piece of equipment. In that case, rail transportation may be used.

The presence of the cogeneration facility, the exhaust stacks, and the new 230-kV transmission line is not anticipated to result in a significant impact on air traffic. Air traffic in the area is low since the nearest airport is 7 miles away, and there are no major destination areas in the project vicinity. The Federal Aviation Administration has indicated that warning lights are not needed on the exhaust stacks (BP 2002).

3.15.3 Impacts of No Action

Proposed Roadway Improvements

Whatcom County's Six-Year Transportation Improvement Program lists the following proposed road improvements in the project vicinity:

- Birch Bay-Lynden Road/Portal Way intersection: Traffic signalization
- Kickerville Road from Rainbow Road to SR 548: Reconstruction
- Vista Drive from Ferndale city limits to SR 548: Reconstruction
- Grandview/Point Whitehorn from Koehn Road to Jackson Road: Reconstruction
- Bay Road from Valleyview Road to the east 0.25 mile: Intersection improvements
- Kickerville Road from SR 548 to Birch Bay-Lynden Road: Reconstruction

WSDOT has three proposed improvement projects scheduled for SR 548, as follows:

- SR 548 from MP 3.75 to MP 3.80 Northstar Road vicinity: Culvert replacement
- SR 548 MP 5.16 Kickerville railroad crossing: Culvert installation
- SR 548 from MP 11.54 to MP 11.58 Dakota Creek Bridge 548/10: Bridge replacement

Traffic Volumes

Travel demand on the roadway network would be composed of two elements:

- Existing traffic
- Estimated future non-project traffic

Existing traffic volumes were discussed in Section 3.15.1. Estimated future non-project traffic growth is generally composed of the following:

- Traffic volumes generated by other land development projects that are planned but not yet operational,
- Changes in traffic patterns from roadway improvements or operations, and
- Effects of population and business growth.

No new developments are proposed in the project vicinity that would add traffic volumes to the roadway system in the next few years. Also, no anticipated changes in area traffic patterns from roadway improvements or changes in traffic operations are expected by 2004. Finally, a 5% annual traffic growth rate was used to estimate future impacts from population and business growth in the area. This rate was based on historical traffic counts during the PM peak hour at the SR 548/Kickerville Road intersection.

The 5% annual growth rate in traffic volumes, which accounts for the effects of general population and business growth in the area, provides a conservative estimate since the rate of population growth in Whatcom County is expected to be about 2% per year.

Figure 3.15-8 shows projected No Action 2004 ADT volumes and PM peak-hour traffic volumes at intersections on SR 548. These volumes include the existing traffic volumes plus the 5% annual traffic growth rate.

Under the No Action Alternative, traffic volumes in the area would be expected to increase at approximately 5% per year. As shown in Table 3.15-2, intersections on SR 548 would continue to operate at LOS B or C. The only exception is the SR 548/Portal Way intersection, which would operate at LOS D, which is still considered acceptable by WSDOT. No traffic or transportation impacts would result.

Levels-of-Service

LOS was determined at the intersections on SR 548 during the PM peak hour for the No Action Alternative (Table 3.15-8). Average delays would increase over existing conditions, but the intersections would continue to operate at LOS B or C, which is within acceptable county standards. The only exception is the SR 548/Portal Way intersection; it is calculated to operate at LOS D, which is still considered acceptable. Delays would be of short duration, and no substantial traffic queuing or congestion is expected. No traffic or transportation impacts would result from the proposed project.

Table 3.15-8: PM Peak Hour Level-of-Service Summary – No Action

Intersection	Movement/Approach	2004 Without Project[1]
SR 548/I-5 northbound on-ramp (MP 0.00)	Northbound	C (24.8)
SR 548/I-5 southbound on-ramp (MP 0.09)	Southbound	B (12.7)
SR 548/Portal Way (MP 0.29)	Overall	D (25.6)
SR 548/Vista Drive (MP 0.97)	Overall	B (12.1)
SR 548/Kickerville Road (MP 4.93)	Northbound	C (15.6)
SR 548/Blaine Road (MP 5.93)	Southbound	B (13.0)
SR 548/Birch Bay-Lynden Road (MP 8.96)	Overall	B (18.8)
SR 548/Peace Portal Drive (MP 11.80)	Southbound	C (20.6)

1 Number shown is the average control delay in seconds per vehicle for the overall intersection at an all-way, stop-controlled intersection, or worst-case approach at a stop-sign-controlled intersection. These values determine the LOS for intersections according to the 2000 Highway Capacity Manual (Transportation Research Board 2000).

MP = milepost

3.15.4 Secondary and Cumulative Impacts

No significant cumulative traffic or transportation impacts are anticipated for the following reasons:

- Because of the low population and rural nature of the surrounding area, there are no commercial services such as housing, lodging, retail, restaurant, or medical facilities in the immediate vicinity of the site.
- The nearest facilities are 2 miles to the north in Birch Bay and 5 miles to the east near I-5. More extensive commercial facilities and services are located in Blaine, Ferndale, and Bellingham.

Figure 3.15-8: Projected 2004 PM Peak-Hour and Average Weekday Traffic Volumes without Project

- Because of the anticipated short-term project construction (24 months) and the associated workforce, permanent commercial services would not likely be established near the site.
- The low employment levels during project operation also would not support permanent commercial services near the site.

The construction schedule of the GSX Pipeline coincides with construction of the cogeneration facility. There may be a degree of cumulative impact during construction, but the magnitude is not possible to quantify at this time.

3.15.5 Mitigation Measures

The Applicant is meeting with WSDOT and traffic engineers from Whatcom County to discuss appropriate mitigation measures to address the impacts described above.

Mitigation Proposed by the Applicant

- A traffic signal would be installed at the intersection of Grandview Road (SR 548)/Portal Way to improve LOS.
- A westbound left-turn lane would be constructed on SR 548 at the Blaine Road intersection.
- An access road would be located approximately 1,000 feet east of Blaine Road. WSDOT has determined that the access road has adequate sight stopping distance. The access road would be constructed and paved to meet applicable geometric and safety standards. Pavement markings, gates, and traffic signs would be installed on the proposed road, including a stop sign at the SR 548 intersection.
- Temporary traffic control plans would be developed and implemented to ensure safe travel conditions during construction within the Grandview Road and SR 548 rights-of-way.
- An onsite Transportation Coordinator could be designated during construction. Duties of the coordinator would include managing site-generated traffic and parking at the site, establishing and managing any remote parking lots and related shuttle bus or van services, and promoting carpooling and vanpooling to site workers. The Transportation Coordinator would also serve as the point of contact for county and state agencies regarding traffic and transportation issues and permits related to the construction project.
- Preferential parking for carpools and vanpools could be established at the site during construction.
- To the extent practical, the work hours of various groups of workers (such as a construction trade or employees of a company) during the daytime on weekdays would be shifted slightly away from each other. This would disperse the site-generated traffic during the AM and PM peak hours and reduce the potential for queuing.
- Permits or approvals would be obtained as required to conduct oversize or overweight hauls. Delivery of heavy or oversized equipment would be by rail or barge, as practical.

Additional Recommended Mitigation Measures

- Intersection improvements to accompany traffic signalization should be investigated at the Portal Way/Grandview Road (SR 548) and Blaine Road/Grandview Road (SR 548)

intersections. Traffic signalization may warrant changes to intersection operation such as left- or right-turn lanes.

- All mitigation measures listed above should be carried out by the Applicant to maintain a positive and safe traffic flow. Preferably, these would be incorporated into a Transportation Management Plan that would be applicable during both construction and operation of the proposed project and approved by EFSEC prior to the beginning of construction.
- The Applicant would keep and maintain county roads and SR 548 free of any debris or hazardous material related to the project. Any spilled material would be cleaned up promptly.

3.15.6 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts on surface or rail transportation systems are anticipated. During regular operation of the facility, intersection LOS are within acceptable limits. During construction, intersection LOS are acceptable except for one location, which exceeds LOS standards. At the completion of facility construction, all intersections operate within acceptable limits.